

a lifting device being operable to lift said crucible;  
a reference reflector located inside said apparatus body;  
an optical device located outside of said apparatus body; and  
level position controlling means for controlling a level position of said crucible via said lifting device, said level position controlling means comprising:

diameter measuring means for measuring a diameter of the single crystal;

crucible ascent speed calculating means for calculating a decrease in volume of the melt based on the diameter of the single crystal measured by said diameter measuring means and a pulled crystal length of the single crystal and calculating an ascent speed of said crucible based on the decrease in volume of the melt;

level position measuring means for measuring an actual level position by detecting a mirror image position of said reference reflector reflect by a surface of the melt using said optical device; and

crucible ascent speed adjustment value calculating means for calculating an adjustment value of the ascent speed of said crucible based on an output from said level position measuring means, wherein

said level position controlling means controls the level position of said crucible based on the ascent speed adjusted by the adjustment value when certain criteria are satisfied and said level position controlling means controls the level position of said crucible based on just the ascent speed when the certain criteria are not satisfied.

8. (New) An apparatus according to claim 7, further comprising adjustment value adding means for adding the adjustment value to the ascent speed.

9. (New) An apparatus according to claim 8, further comprising adjustment value addition proprietary judging means for judging whether the certain criteria are satisfied for adding the adjustment value to the ascent speed, wherein the certain criteria are a diameter of the single crystal, the actual level position measured by said level position measuring means, a distance between the single crystal and said reference reflector, and a crucible rotational speed.

10. (New) An apparatus according to claim 8, further comprising averaging means for averaging a plurality of level positions measured by said level position measuring means.

11. (New) An apparatus according to claim 8, wherein said optical device is also used in measuring the diameter of the single crystal.

12. (New) An apparatus according to claim 8, further comprising automatic updating means for automatically updating a conversion equation for converting the mirror image position of said reference reflector on the surface of the melt to the actual level position by moving said crucible up and down from an initial position to obtain a relationship between the mirror image position of said reference reflector on the surface of the melt and the actual level position and making the relationship approximate to a straight line.

13. (New) An apparatus according to claim 8, wherein said optical device comprises a first camera and a second camera, said first camera being operable to measure the actual level position and said second camera being operable to measure the diameter of the single crystal.

14. (New) An apparatus according to claim 9, further comprising averaging means for averaging a plurality of level positions measured by said level position measuring means.

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